

PATENT APPLN. NO. 10/590,442  
RESPONSE UNDER 37 C.F.R. §1.111

PATENT  
NON-FINAL

REMARKS

Claims 1-4, 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Honda et al., US 5,994,429 ("Honda"), in view of Nawakowski et al., US 3,386,956 ("Nawakowski"). Claims 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Honda in view of Nawakowski and Middleman, US 5,269,863.

Claim 1 has been amended to recite that the epoxy resin composition of the invention comprises, optionally, a thermoplastic resin, and that a content of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic resin [E], in the epoxy resin composition is 5% by weight or less.

The amendments to claim 1 are supported, respectively, by the descriptions in the specification on page 16, lines 11-12, and page 17, last paragraph. The last paragraph on page 17 reads:

"The epoxy resin composition of the present invention may contain a compound other than the above described ones.

For example, to improve the flame retardance, it may contain a metal oxide or a metal hydroxide. However, the content of such a compound in the epoxy resin composition is preferably 10% by weight or lower, more preferably 5% by weight or lower and much more preferably 0% by weight.

The amount exceeding 10% by weight may sometimes be

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unsuitable from the viewpoint of providing a  
lighter-weight fiber-reinforced composite material."  
(Emphasis added).

Claim 1, as amended, overcomes the 35 U.S.C. § 103(a) rejection over Honda in view of Nawakowski for the reasons explained below. The claims which depend, directly or indirectly, on claim 1 are also patentable under 35 U.S.C. § 103(a) over Honda in view of Nawakowski and over Honda in view of Nawakowski and Middleman, as a consequence of the patentability of claim 1.

#### Present Invention

The primary object of the present invention is to provide a **light-weight fiber-reinforced composite material** which has superior flame retardance and mechanical properties and never emits a halogen gas when it is incinerated. (Please see the bottom two paragraphs on page 5 of the English specification).

The paragraph at the bottom of page 17 cited above indicates that when the content of a compound other than the components [A], [B], [C], [D], and if present, a thermoplastic resin, in the claimed epoxy resin composition is 5% by weight or lower, a light-weight fiber-reinforced composite material can be provided.

#### Honda

The halogen-free flame retardant epoxy resin composition

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according to the Honda reference requires, as an indispensable component, an inorganic filler (D).

In column 3, lines 24 to 31, Honda teaches that the inorganic filler imparts flame retardance, heat resistance, and moisture vapor resistance to the epoxy resin composition, and that examples of the inorganic filler includes talc, silica, alumina, aluminum hydroxide, magnesium hydroxide powder and the like.

In the working examples of the reference, aluminum hydroxide is used as an inorganic filler. The contents of the aluminum hydroxide in the working examples are very high and lead away from an epoxy resin composition containing 5% by weight or lower of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic resin [E]. Specifically, the content of aluminum hydroxide is 27.8% by weight in Example 1 (175 parts per 629.1 parts), 17.3% by weight in Example 2 (100 parts per 579.1 parts), and 23.9% by weight in Example 3 (115 parts per 481 parts).

Therefore, in terms of the feature newly added to claim 1 (5% by weight or lower of said compound), the present invention is clearly distinguished from Honda. The specific gravity of aluminum hydroxide is about 2.4. Considering this specific gravity and said high content of aluminum hydroxide, it is expected that the epoxy resin composition taught in Honda does not have a specific gravity

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as low as 1.35 or lower, which is claimed in claim 11 of the present application. If the epoxy resin composition taught in Honda is used as a matrix resin to form a fiber-reinforced composite material, the weight of the material thus formed cannot be as light as achieved in the present invention.

Honda does not teach reducing the specific gravity of the epoxy resin composition by lowering the content of the inorganic filler down to 5% by weight or lower with the aim of providing a light-weight fiber-reinforced composite material. On the contrary Honda rather teaches away from doing so. For at least this reason, Honda alone or in combination with the other cited references does not render the present invention obvious within the meaning of 35 U.S.C. § 103(a).

Removal of the 35 U.S.C. § 103(a) rejections and a notice of allowability are believed to be in order and are respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated July 22, 2010, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

Oct. 22, 2010 8:21PM Kubovcik and Kubovcik

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In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to Deposit Account No. 111833.

In the event any additional fees are required, please also charge Deposit Account No. 111833.

Respectfully submitted,

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